EPA Comments on the
Final Draft Phase I RFI/RI Work Plan
Woman Creek, Operable Unit 5
March, 1991

General Comments

The text does not provide analytical data for all the sample locations in the operable unit and therefore lacks a thorough evaluation of existing data. Air data and associated interpretation is missing completely. Review of all existing data is a necessary part of the RFI/RI process. The review should take place prior to writing the workplan in order to develop a meaningful workplan that covers data gaps and does not duplicate previous efforts. Review of previous data is necessary to further define data quality objectives and to develop an adequate field sampling plan. The data validation process must be accelerated in order to evaluate data in a timely manner.

It is inappropriate to disqualify pathways of exposure prior to accumulating and evaluating any sample data. Until initial investigations are completed, all pathways are to be considered.

The air monitoring stations for monitoring possible releases from the old landfill which were recommended by EPA and agreed to by DOE during previous OU5 scoping meetings must be included in the field sampling plan. This data is also needed for completion of the baseline risk assessment.

Characterization of the geohydrology would greatly benefit with the addition of a geophysical investigation. Based on the results of the investigation, appropriately located bedrock monitoring wells would further aid development and refinement of the site hydrogeologic conceptual model. This type of information will be necessary for characterization of the operable unit. A sample and analysis plan is necessary for investigation of contaminant fate and transport in the vadose zone.

Because parts of OU5 and OU1 are overlapping and OU1 surface water drains into OU5, the findings from the separate investigations are not mutually exclusive. OU3 investigation results will also be of benefit to OU5. Results from each of the OU investigations will enhance each other. The RFI/RI workplan and reports must discuss the overlapping data. It is important to evaluate the data and think through the remedial processes of these OUs simultaneously to adequately interpret fate and transport of contaminants and properly coordinate the remedial

activities of each.

As addressed in the scoping meetings, the radiological survey at the old landfill was to be summarized and included in the workplan. Other types of radiological surveys were to be investigated and summarized for applicability to remedial activities. The workplan text indicates that a summary of the survey will be included in the RFI/RI report.

Also, during the scoping meetings, it was decided that a summary of the 1985 study on the old landfill would be included in the workplan. The workplan indicates that only a Fiddler survey will be completed for other IHSSs within the OUs.

Requirements in the Plan for Prevention of Contaminant Dispersion must be included in the workplan.

In several locations within the body of the text, a phased approached to investigation of the operable unit is presented. A phased approach in which multiple workplans are submitted is not acceptable. The workplan must be comprehensive as is considered the road map for complete characterization of the operable unit in order to arrive at an acceptable CAD/ROD. It is acceptable to apply a staged approach in which decision points are identified during field analyses directing the next appropriate investigative action. The decision points are to be documented with technical memoranda, approved by the regulatory agencies, and attached to the workplan. The staged approach could allow for adjustment to the field investigation in order to obtain necessary data to adequately meet the requirements of an RFI/RI report (i.e. characterize the nature and extent of contamination and complete a baseline risk assessment). The workplan fails to address on what basis future field investigative decisions will be made and how this will occur without impacting the IAG schedules and planning documents.

Executive Summary

The FSP must be amended to reflect discussions at the scoping meetings held in December, 1990 and February, 1991.

The outline of work activity for the ash pits, must include a reevaluation of the extent of the disposal areas in light of the air photos as stated in the IAG, Statement of Work, Table 5.

Section 1.3.3.2 Surface Water Hydrology

The section must reference the diversion systems on the Woman and Walnut Creeks, illustrate on a map, and refer to the Surface Water Management Plan.

Section 1.3.5 Ecology

The section can be updated with information gained from the Environmental Evaluation study.

Section 1.3.6.3 Arapahoe Formation

This section will need to be updated with information gained from the sitewide seismic study. The current characterization is generalized and does not adequately define the lithology and hydrology underlying the IHSSs in the operable unit and how the lithology and hydrology may vary from this operable unit to elsewhere on plantsite. The hydrogeologic conceptual model has changed from previous reports. Additional supporting information must be submitted.

Section 1.3.6.4 Laramie Formation and Fox Hills Sandstone

The thicknesses described for the upper and lower Laramie Formation are not consistent with those in Figure 1-4.

Section 2.0 Preliminary Site Characterization

A area of disturbed ground south of the interceptor ditch and approximately 1,600 feet west of IHSS 209 must also be investigated.

Section 2.1 Woman Creek

Figure 2-2 must show the diversion structure from Pond C-2.

A summary of the parameters regulated under the NPDES permit needs to be presented.

See comments under section 2.4.2.

Section 2.2 Original Landfill (IHSS 115)

Field investigation by EPA and CDH personnel verified the presence of waste south of the South Interceptor Ditch and up to Woman Creek in some areas. Additionally, the landfill appeared to extend farther to the east than depicted in figure 2-2. This may be the surface area disturbance depicted east of the landfill in figure 2-2. This area will also need to be investigated as part of the landfill. Figures 2-2 and 2-3 will need to be modified to reflect an accurate representation of the extent of debris. The square footage stated in the text also will need to be amended. The 1971 air photo shows disturbed ground extending northeast of the landfill's currently depicted western extension. The description of elevation is not consistent with figure 2-3.

Two ponds were present in the vicinity of the landfill. The one depicted in Figure 2-1 and another which was in a north-south

drainage in the central part of the landfill. The text describes only one pond and attributes characteristics of both the ponds to the description. The revised workplan must describe both ponds accurately and the field sampling plan must be written to investigate both ponds.

The locations of the hot spots from which material was removed need to be identified in the RFI/RI workplan. Additionally, the method(s) of detecting and locating these areas must be identified. The field sampling plan must apply information from the previous removal to the current investigation.

Drawings showing the piping connections and sources to the two outfalls must be provided. Any sample events and results of seep water from the landfill or the outfalls must be provided.

Section 2.2.4 Nature of Contamination and Previous Investigations

It is not clear if table 2-2 is a listing of contaminants found above detection limit or of contaminants analyzed. Clarification is needed. The parameters listed as potential contaminants (i.e. plutonium, beryllium, uranium-234 and pesticides) were not listed in the table and need to be. Basically, all sample results must be provided. Additionally, sample results from wells 57-86 and 4-81 and surface water stations SW-38, SW-37 and SW-36 must be evaluated and presented. The field sampling plan must be based on results from all data and not just a selected subgroup.

Sample results show that the unfiltered gross beta value is less than the filtered sample. This indicates that the sensitivity for gross beta analyses must be improved.

The methods and results of the in-situ radiological survey performed in 1990 must be reported. Results of other previous investigations must also be submitted. This information is necessary to develop the field sampling plan and the baseline risk assessment.

Section 2.2.5 Geology and Hydrology

The isopach map shown in Figure 2-4 is based on 5 data points. Based on this limited amount of information, all the contours need to be dashed. The map indicates that the colluvium and Rocky Flats Alluvium are of homogenous thickness and display uniform tapering in thickness southward. It is known from current plant-wide evaluations, that the geology of the Rocky Flats plant site is inhomogeneous. To better understand the nature of the underlying geologic units, geophysical methods need to be applied. It is not informative nor supported to state that the hydrologic conductivity of the Arapahoe Formation as "fairly

impermeable". Further characterization is needed.

The potentiometric surface map shown in Figure 2-5 is also based on limited data and therefore, all the contour lines need to be dashed. Potentiometric surface lines incorrectly cross topographic lines. The map does not account for the southern drainage of Woman Creek. Further investigative work is necessary to properly characterize the alluvial aquifer.

Section 2.3.1 Location and Description (Ash Pits)

Aerial photographs indicate additional areas of disturbed ground where ash pits could be located. The location of ash pits in the text must be compared further with the air photos for revisions and additions..

Section 2.3.3 Surface Drainage

The ditch mentioned needs to be shown on figure 2-6. The time during which the ditch was installed must be stated. Prior to construction of the ditch, surface runoff was likely much higher which could allow for considerable transport of contaminants. This must be considered for revision of the FSP.

Section 2.3.4 Nature of Contamination and Previous Investigations

The amount of depleted uranium that is stated to have been incinerated, is 100 grams. This is inconsistent with the landfill section which states that 60 kg of depleted uranium were inadvertently burned at the incinerator. The inconsistency must be corrected in the revised workplan.

The analyses of the rayscope investigation and an explanation of the rayscope survey must be provided.

Table 2-3: See comments Section 2.2.4. Surface water and sediment data must be submitted for review.

Section 2.3.5 Table 2-3

The cesium isotope must be identified.

Section 2.4.1 Location and Description

It might provide some clarification to mention that while C-1 is located on Woman Creek, C-2 is an off-channel pond, with Woman Creek routed around it.

Section 2.4.2 History

The text needs to contain an explanation of the treatment process that was undertaken for C-2 water. The activated carbon

treatment was provided by pumping C-2 water to Pond A-4 for a period of time due to high concentrations of atrazine, but the activated carbon treatment has stopped and will not be resumed unless necessary. The water diverted around Great Western Reservoir via the diversion ditch goes into Walnut Creek, which is a tributary of Big Dry Creek. The plans underway to pump water from Pond C-2 to the cooling tower water supply system at the plant site needs to be described. Pond C-2 water was bypassed into the diversion ditch starting in mid June, 1991. The text needs to be updated with this information.

An apparent pipeline or diversion structures exists in the 1980 air photos. The presence or absence of these structures must be researched and investigated if necessary.

Section 2.3.3 Surface Drainage

The South Interceptor Ditch drains into pond C-2 and is thus considered part of the IHSS.

Section 2.4.4 Nature of Contamination and Previous Investigations

The Discharge Monitoring Reports (DMRs) and other pertinent information collected as part of the NPDES permit must be researched and summarized in the workplan.

The value for gross alpha must equal that of total alpha radiation as these are the same parameters. The text needs to be clarified. The units for sediment samples is ug/g and not ug/l.

The Paine (1980) report appears to contain valuable information pertaining to the transport of radionuclides. This information may be useful in development of the risk assessment. Analytical data from this report should be provided for review in the workplan. The evaluation provided in the current text needs to acknowledge the elevated concentrations of plutonium in the sediment and water collected from Pond C-1. The statement that the plutonium levels are relatively lower in the C-1 sediments is not meaningful given the high counting error for the C-1 sample.

A list of the parameters sampled and the associated results must be provided. In order to properly interpret the data, it is necessary to show the values over time. This information is not provided in Tables 2-5 and 2-6. Standards for these parameters must be provided for reference.

It is necessary to indicate if the metal values are for total metals or total recoverable metals. It is recommended that under Anions and Cations the term bicarbonate be used in place of carbonate, hydrogen. The elevated metal values for SW-36 in Table 2-6 are somewhat high which need to be explained.

The tritium value for SW39 is six times greater than that for SW32. An explanation is required. The gross alpha value for filtered samples is greater than that for unfiltered. This indicates problems with sampling and/or analytical techniques, which must be corrected prior to field investigation. The MDA must be shown for all the radionuclides. The sample results indicate that some radionuclides were not detected yet it is more likely that they are present but are below the detection limit. Basically, further evaluation of all the data is needed. The text needs to be clarified in terms of the values for the radionuclide concentrations as being an average or maximum.

The section needs to present and evaluate data from all the monitoring wells, sediment stations, and surface water stations shown on figures 2-7 and 7-2. A complete evaluation of all the data in the drainage is a necessary part of the RFI/RI process.

Elevated concentrations of radionuclides found in surface water station SW-36 indicates possible release from the landfill. This must be mentioned in Section 2.2.4.

Basically, further evaluation of all the data is needed.

Section 2.4.5 Geology and Hydrology

Hydrologic testing and geologic characterization of the Arapahoe Formation underlying the ponds is necessary to confirm the currently unsupported statement that clays with little ground water flow underlie the ponds.

Section 2.5 Surface Disturbance (IHSS 209) and the Surface Disturbances South of The Ash Pit Area

An additional area of surface disturbance has been identified from review of the air photos (1955) and was discussed in scoping meetings. This area lies to the west of IHSS 209. Investigation of this area is also required.

The 1978 air photo shows a different configuration of trenches than depicted on figure 2-6. Confirmation of the trench locations is necessary.

Section 2.5.2 History

It appears, in the 1955 photo, that a pond to the north of IHSS may be present.

Section 2.5.3 Surface Drainage

The water that flows southward from IHSS 209 and the other area of disturbed ground would flow into Smart Ditch. If contamination is found in these areas, then the southern extent

of contamination needs to be investigated.

Section 2.5.4 Geology and Hydrology

The text needs to state the possibility that sandstone units within the Arapahoe Formation are present in the area of disturbed ground.

Section 2.6.1 Conceptual Model for the Original Landfill

It is premature to assume that the only receptors from the air pathway are plant workers and animals. Air data and pathway analyses were not provided in the workplan for review. Until such analyses are performed adequately and it is determined that the public is not susceptible to exposure from the old landfill, the public must also be considered receptors.

The soil cover on the old landfill is eroded away in areas. Therefore, it is not correct to state that surface water will not come into contact with wastes at the landfill.

It is possible that sandstone units within the Arapahoe Formation are present under the landfill are hydraulically interconnected with the surficial units. This must be stated in the text.

Seeps must be located and sampled if appropriate.

Section 2.6.2 Ash Pits, Incinerator and Concrete Wash Pad

Ash was disposed of in the ash pits, concrete wash pad and Woman Creek. Ash in the later two disposal sites are susceptible to movement through surface water runoff. In the case of the landfill, it is not stated that standard procedures were to dump a cement mix onto the ash. Ash may have been dumped over concrete. Therefore, the surface water pathway **must** be considered. Until sample information is gained to determine otherwise, the air pathway **must** also be considered.

Section 2.6.3 Ponds C-1 and C-2

The air pathway is to be considered during times of low water line in the ponds and during remediation efforts. Discharge and diversion of pond water causes a decrease in volume exposing sediment which allows access of potential contaminants to the air pathway. Until data prove otherwise, the air pathway must be considered.

The section on surface water must be updated. The water does not continuously undergo treatment. Discharges are also monitored for compliance with the Agreement in Principal between DOE and the State of Colorado.

Sections 2.6.4 and 2.6.5 Surface Disturbances

Surface water running off of the disturbed areas identified in the workplan has a potential of running into Smart Ditch as well as Woman Creek. Thus, this must also be considered as a potential surface water pathway.

Humans offsite are also potential receptors for the air pathway.

Section 3.2 The ARAR Process

The ARAR analysis process must evaluate chemical specific ARARs, Location Specific ARARs and Action Specific ARARS. A summary of how these various ARARs are evaluated in the RI/FS process is as follows:

-Chemical specific ARARs are proposed during the draft and final RFI/RI workplan and report and are finalized during the draft and final CMS/FS report.

-Location specific ARARs and preliminary remediation goals are proposed during the draft and final RFI/RI report and are finalized during the draft and final FS. The remediation goals are based on risk assessment, proposed ARARs and the NCP.

-Action specific ARARs are finalized during the draft and final FS.

The workplan must be written to accommodate this process. Failure to do so will result in an inadequate RI report.

Tables 3-1 and 3-2 are missing SDWA values for Strontium 90 and Tritium. A footnote for gross alpha needs to be added explaining that this excludes uranium. It should be noted that the 4mrem/yr for gross beta is a screening level. This screening level can be used to calculate the maximum concentrations of the cesium isotopes. It is beneficial to identify the maximum values for the contaminants present in the operable unit in this table.

Newly promulgated (1/30/91) MCLs and MCLGs are relevant and appropriate and are not TBC. These standards may be considered as applicable on the date they become effective. TBC values in Tables 3-1 and 3-3 must be changed, where appropriate, to meet this rule. Background for a particular parameter is also considered an ARAR and not TBC until an ACL is established for that parameter.

The sampling and analysis plan must be written to allow evaluation of the data in regard to the ARAR values and the 10-6 point of departure in the risk assessment. This should also be

established as a DQO.

Section 3.2.3 ARAR Categories

The state construction standard for plutonium is soil must be considered as a chemical-specific ARAR.

Potential ARAR values for radionuclides need to be revised in Table 3-1 to reflect the state temporary standards for ground water which are the same for the Woman Creek surface water segments. RCRA Appendix 9 constituents need to be listed as potential ARARs.

Units within Tables 3-1, Table 3-2 and Table 3-3 need to be uniform for comparability. It is beneficial to list maximum concentrations of parameters for all media on the tables (see OU1 Workplan, Section 7).

Section 3.2.5 Remediation Goals

The third bullet listed under development criteria for remediation goals must be changed to read "...in cumulative risk in excess of 10^{-6} and not 10^{-4}. The NCP reference was interpreted incorrectly. The sampling and analysis protocols need to be adjusted for evaluation of the data in regard to the 10^{-6} risk level. It is not required that clean up levels be established in the workplan but it is necessary to establish sampling and analysis protocols that will be sufficient to evaluate the 10^{-6} point of departure.

Section 4.1.2 Evaluate Available Data

The possibility for volatile and semi-volatile organic contamination is possible in the landfill due to chemicals disposed of in the landfill and ponds which catch surface runoff and runoff from the south interceptor ditch.

The section must address what previous data sources are and how they will be used for evaluation. Problems with data validation are still apparent. The reason for the problems must be identified and corrected prior to field work start up.

Section 4.1.3 Develop Conceptual Models

The conceptual models specific to each IHSSs in OU 5 need to be developed. Contaminant particle size must be considered in designing the sampling and analyses plans and evaluating exposure pathways.

Section 4.1.4 Specify Phase I RFI/RI Objectives and Data Needs

Multiple phases of investigation requiring submittal of

revised workplans are not encouraged. It is more cost and time effective to prepare a complete field sampling plan and to thoroughly analyze the existing data prior to beginning field work. Data analyses of field samples and activities must be evaluated concurrently with ongoing field work. In this way, changes to the field sampling plan can be made as needed. Section VI. B. of the Statement of Work in the IAG states that technical memoranda to EPA and the State documenting the need for additional data are to be submitted in the event that the workplan needs modification. The modification then becomes an amendment to the workplan. Additional phases are not scheduled for OU5 in the IAG and in the IAG planning documents. If additional work is necessary based on results of preliminary work, the additional work must be completed in a manner as to meet the IAG schedules. EPA will not approve a schedule extension based on an inadequate field investigation for a RFI/RI report.

Table 4-1:

Plumes and hot spots must be characterized at the old landfill (see Nature and Extent of Contamination). The geology and hydrology of the operable unit and IHSSs need to be characterized. Geophysical methods should be added to the sample and analysis methods for characterization of the landfill and the surface disturbed areas. Level IV (Level of Analysis) must be applied to the investigation for the first three bulleted items.

Section 4.2.2 Identify Data Types

A determination of whether additional air monitoring is necessary for adequate completion of the risk analysis is necessary. The air pathway must be investigated for exposure from the potential release of radionuclides at the old landfill as discussed in scoping meetings and update meetings regarding the old landfill.

In regard to the Phase I program reference, see comments under 4.1.4.

Section 4.2.4 Identify Data Quantity Needs

The data quantity needs should be known before field work begins by thoroughly evaluating the existing data. The workplan can be amended as field work is in progress upon receipt and evaluation of data collected during the field investigation. See comments under section 4.1.4 regarding subsequent phases.

Section 4.3 Stage 3 - Design Data Collection Program

The discussions of the scoping meetings also are to be considered in designing the data collection program. This

workplan was not modified in the three month period from the time of the scoping meetings to the delivery date.

Table 4-2:

-Geophysical test methods need to be added to level 1 tasks.

Section 5.1 - Task 1 - Project Planning

The review from which Section 2 was based, is inadequate in that not all available surface water, ground water, soil and sediment data were reviewed, no air data were reviewed within the operable unit and within overlapping operable units. Additionally, the data needed to be evaluated in terms of tables and trend analyses (were possible).

In preparing the workplan, it should have already been determined if the available data will meet the DQOs so that data gaps can be filled in.

Section 5.3 Task 3 - Field Investigation

The task must also characterize the geohydrology of the operable unit and IHSS's. Screening activities will need to include geophysical methods in order to assist collection geohydrologic information. Field activities need to be based on the IAG and scoping meetings.

Section 5.3.1 Old Landfill

The evaluation of the radiological survey should have been completed prior to submittal of the workplan. The revised workplan will need to include a complete evaluation of the survey.

Geophysical methods will greatly assist in the initial field investigation of the old landfill to determine depth of fill and possibly the underlying stratigraphy.

The extent of the old landfill must be verified.

Section 5.3.2 Ash Pits

The location of the ash pits needs to be verified by review of air photos and field surveys.

Section 5.3.3 Detention Ponds

The south interceptor ditch water must also be sampled.

Any seeps within the OU must be identified and sampled.

Section 5.3.4 Surface Disturbance Areas

Magnetometer surveys will need to be conducted over the three areas of disturbed ground as discussed in the scoping meetings with the regulatory agencies. The third area of disturbed surface area must be added to this section.

Section 5.5.1 Site Characterization

The hydrostatic characterization of the underlying units of the operable unit must include the hydraulically connected bedrock units.

As discussed in the scoping meetings, geophysical investigative techniques will greatly assist site characterization. Consideration of these techniques should be addressed as initial steps in the RFI/RI process.

Data quality objectives for ground water modeling need to be determined now in order to collect the necessary data during the field season.

Section 5.7 Task 7 - Development and Screening of Remedial Alternatives

See comments under section 4.1.4 regarding multiple phases of investigation.

Table 5-1: The general response actions must consider RCRA and Colorado Hazardous Waste Act requirements when necessary.

Detailed Analysis of Remedial Alternatives: See comment under section 4.1.4 regarding multiple phases of investigation.

Section 5.8 Treatability Studies

The sitewide treatability studies report must be referenced as part of the scope of this workplan.

Section 5.9 Task 9 - Remedial Investigation Report

The RFI/RI workplan is to be designed to write a complete RFI/RI report. The RFI/RI report is <u>not</u> to be used to identify data gaps. An incomplete RFI/RI report will <u>not</u> be approved thus jeopardizing schedules which are enforceable under the IAG.

Section 7.1.3 Modifications to the IAG Plan

The areas of surface disturbance need to undergo a magnetometer survey or other geophysical test method to determine the presence or absence of buried wastes in the area. This was

discussed in the scoping meeting.

The results of the rad survey were required to be presented in the workplan to determine the adequacy of the survey. The last oral summary received by EPA on the survey was not conclusive as to the effectiveness of the survey and need for additional investigation. The In-Situ Survey of U.S.DOE's Rocky Flats Plant was submitted under separate cover in June, 1991, two months after the RFI/RI workplan submittal.

Collection of borehole samples from the old landfill for volatile and semivolatile organics needs to be based on specific criteria such as indication from field screening equipment or stained area. This needs to be detailed in the SOPA if it differs from the sitewide SOPs.

While the area to the east of the old landfill needs to be investigated through borehole drilling and sampling, borings and samples must also be taken hydrologically downgradient of the old landfill. Specifically, boreholes are needed where stated in the IAG and near the south east corner of landfill and immediately south of the interceptor ditch.

The samples collected from the ash pits must also be sampled for the isotopes of uranium.

The text must indicate that the samples collected from the ponds are cored samples.

The surface water and sediment samples collected as background samples along Woman Creek are considered additional to those stated in the IAG. The background samples should be included in the background geochemical characterization report as well.

The samples which are to be analyzed for pesticides and PCBs along Woman Creek need to be specified. If it is determined that these parameters are present, additional sampling may be required.

Section 7.2 Phase I Investigation

See comments under section 4.1.4 regarding phased approached (this applies to the entire section).

The area of surface disturbance which is west of IHSS 209 must also be investigated.

Table 7.3 will need to be modified according to the comments below.

Section 7.2.1 Old Landfill

As discussed during the scoping meetings, it is more beneficial to conduct a geophysical survey of the landfill prior to soil gas sampling in order to determine locations and grid spacing for subsequent soil gas sampling. HydroPunch sampling could be quite effective for initial ground water screening within the landfill. HydroPunch sampling locations can be determined based on the analyses of soil gas, rad and geophysical surveys. Real-time water and soil data from the HydroPunch samples can be obtained by using onsite gas chromatography in conjunction with soil gas analyses. Application of fluorometric laboratory procedures with hydropunch sampling would enable identification of uranium contamination and migration from sources within the landfill. These sampling and analyses techniques can be applied to the other IHSSs in the operable unit.

The locations of the soil gas sampling stations must be shown on a map of the old landfill. The depth of the soil gas probes should be modified from two feet to five to 10 feet, depending on the depth to ground water, due to the cover that was placed on the landfill. Vinyl chloride and 1,2 dichloroethane, degradation products of TCE, should also be analyzed as part of the soil gas testing. The area of disturbed ground east of the landfill and the area south (downgradient) of the landfill should also undergo soil gas sampling. HydroPunch sampling would be appropriate for these areas as an initial screening of contamination.

Soil cores will need to be collected wherever soil gas analyses indicate potential contamination. Two cores are not adequate for characterization of the entire site; a tighter grid is necessary for soil core sampling. The extended boundaries (see comments 2.2) of the landfill must be considered in redesigning the sampling plan. A explanation between soil cores and borings is necessary. The basis on which the decision will be made regarding placement of soil borings must be provided in greater detail.

A monitoring well must be added between the southeast corner of the landfill and the interceptor ditch (see figure 7-1). Additionally, bedrock monitoring wells must be completed downgradient of the landfill in order to characterize the geohydrology of the area. Monitoring wells will need to be sampled quarterly as long as the information is needed in the remedial process.

During site visits by the regulatory agencies, it was determined by the regulatory agencies that a need for soil stabilization of the landfill, air monitoring and additional surface water monitoring may be necessary for protection of human health and the environment and for proper completion of a

baseline risk assessment. In a follow up scoping meeting (2/91), DOE and EG&G personnel discussed what might be the best locations for two additional air monitors near the old landfill. There is no mention of the air monitoring effort in the workplan nor are the additional surface water stations identified and the means of soil stabilization addressed. These issues must be addressed prior to workplan approval.

Section 7.2.2 Ash Pits

Possible waste disposal areas may exist around the old incinerator as well which will require investigation. The 1955 air photo must also be reviewed.

Figure 7-2 shows proposed locations of sediment samples only. Surface water sample locations are shown on figure 7-1.

The third paragraph on page 7-12 appears to be out of place.

The text states that the monitoring well locations for the ash pits will be determined following a review of the geologic characteristics of the site. The means and timing of reviewing the geologic characteristics must be explained and the review must be completed in a timely fashion so as to complete installation of monitoring wells on schedule. The monitoring wells will need to be sampled quarterly as long as the information is needed in the remedial process.

The area of the rad survey must be shown.

Section 7.2.3 C-Series Detention Ponds

Two of the sediment samples need to be taken at the deepest parts of the pond, one sample needs to be taken at the bank of each pond above water line and one sample taken below water line, the fifth sample must be taken within the five feet of the inlet.

The table on page 7-20 indicating the number of sediment samples taken between 113.6 and Pond C-1 needs to be changed to 11 to match figure 7-20. Sampling of existing surface water stations must continue and results reported and evaluated in the RFI/RI workplan. Information from the OU1 investigation which overlaps OU5 must be incorporated in the OU5 RFI/RI process (this includes several monitoring wells, surface water stations, sediment sampling stations and boreholes).

Locations of the upgradient sediment and surface water samples must be illustrated.

The sediment samples which will undergo analyses for pesticides and PCBs must be identified. Special attention must be given to the possibility that pesticides were disposed of in

the old landfill.

Figure 7-4 does not represent all the locations of sediment samples to be taken in the ponds and must.

The location of the original stream channel must be illustrated on a map which also shows the location of the monitoring wells. Monitoring wells will need to be sampled quarterly as long as the information is needed in the remedial process.

In order to adequately characterize the geohydrology underlying the operable unit and specifically downgradient from the ponds, it is necessary to drill bedrock boreholes and complete as monitoring wells as necessary.

Indiana St. needs to be identified on figure 7-2.

Section 7.2.4 Surface Disturbance Areas

The investigation would benefit greatly by a completing a magnetometer survey in the areas prior to sampling. This builds in a safety factor as well as assisting in locating the most appropriate sampling locations. EPA recommended this in the scoping meetings.

Descriptions of how grab soil sample locations will be selected must be presented. It may be appropriate to collect grab samples on a random grid within the trenched area.

Sample locations and survey grids must be identified on figure 7-4.

Table 7-5 Parameters and Detection Limits

The units for tritium in soil/sediment should be pCi/l and not pCi/ml.

Table 7-6 Phase I Analytical Program

Clarification between the two pages of the table and between the table and the text is necessary.

For the old landfill, all samples (all media) need to be sampled for TAL metals (including beryllium), TCL volatiles semivolatiles and pesticides/PCBs and radionuclides (including the isotopes of uranium, tritium and radium). For radionuclide sampling, no more than a 2 ft. interval is allowable for a composite sample.

For the ash pits, samples (all media) must be analyzed for TAL metals, pesticides/PCBs, all the radionuclides listed in the

headings including all isotopes of uranium, tritium and radium. Dioxin and semi-volatile organic analyses must also be run on the ash pit soil samples.

For the ponds, all samples (all media) must be analyzed for TCL volatiles and semivolatiles, TAL metals, pesticides/PCBs and all the radionuclides listed in the headings including all isotopes of uranium, tritium and radium. Nitrates must also be analyzed for surface water and ground-water samples.

For the disturbed areas, soil and boring samples must be analyzed for TAL metals, all the isotopes of uranium, plutonium and americium. Field screening for volatile organics must be used during collection of soil and boring samples. If an indication organic contamination is present (either through the equipment or soil staining) then samples must also be collected for TCL volatiles and semivolatiles.

Section 8.1 Overview-Baseline Risk Assessment

For a more complete list of publications to use when performing the health risk assessment refer to the Final Phase III Revised Workplan for OU1, p. 8-1.

The workplan must specify how the risk assessment process will be carried out for OU5.

In the second bulleted item, the term exposure pathway needs to be replaced with media.

Section 8.2 Identification of Chemicals of Concern

The procedures for this section must be consistent with those outlined by the Technical Risk Assessment Working Group in which EPA and CDH are members.

Data taken from other sources and used in the risk assessment must meet the acceptance criteria under the QA/QC protocols established in this program.

EPA has requested that a TIC evaluation procedure be incorporated in the SOPs and QAPjP. This workplan will need to be revised to be consistent with those procedures.

The criterion of frequency of detection for selecting a list of contaminants of concern must be evaluated carefully. For ground water, the frequency may be dependent on the amount of ground water flow (seasonality) at the time of sampling or the frequency of sampling.

The lack of an ARAR for an chemical is not a sufficient reason for removing the chemical from consideration in the risk

assessment.

Section 8.3.1 Potential Receptors

The baseline risk assessment must include exposure of current and future receptor to contaminated media.

Section 8.3.2 Exposure Pathways

The text states, "Sources of chemical release will be sites within OU5 that contain chemicals of concern significantly above background levels. One of the criteria on which the list of chemicals of concern are developed is the concentration relative to background. Therefore, the referred to statement should be changed to, "Sources of chemical release will be sites within OU5 that contain chemicals of concern."

Section 8.4 Toxicity Assessment

The discussion of uncertainties should be included in the section on uncertainty analysis.

Section 8.5 Qualitative and Quantitative Analysis

The uncertainty analysis should follow the risk characterization section. The risk characterization may also have uncertainties built in to it.

Section 8.6 Risk Characterization

The summed exposure of contaminants must also be addressed. Clarification of the terminology, "reasonable minimum exposure conditions", is necessary.

Section 9 Environmental Evaluation

Comments June 1991 EE are provided below.

QAA Comments

Section 3.1.1 Objectives

The DQOs for environmental evaluations must be added.

Section 3.1.3 Completeness

The target for completeness is 100% and the minimum acceptable is 90%.

Sections 3.1.4 Comparability

SOPs 5.11, 5.12 and 5.13 are also applicable. A

reassessment of which SOPs are appropriate for this workplan must be completed as the SOPs are undergoing changes and approval.

Sections 3.2.1, 3.2.3 and 3.2.6

These sections will need modification based on comments in section 7 of the workplan. Specification of a soil core sample frequency is not a random sample.

Section 3.2.6 Groundwater Samples

The text references SOP 2.2 as that for well installation. rather than for well development. The text needs modification to show that SOP2.2 is for well development and SOP 3.6 is for well installation.

Section 3.4 Environmental Evaluation

SOPs 5.11, 5.12 and 5.13 are also applicable to the EE.

The reference to OU1 should be changed to OU5.

Section 3.7 Quality Control Samples

Equipment rinsate blanks are required at the rate of 1 per 20 samples or 1 per day, whichever is greater.

Section 3.7.2 Laboratory QC

The section is missing a listing of the actual operating conditions in effect during analysis (see OU6 QAA).

See OU6 QAA (section 3.8) for insertion Quality Assurance Monitoring requirements.

Section 3.8.2 Data Validation

The section should reference section 3.7.1 in the QAPjP and the field sample DQOs identified in Appendix A.

Section 3.8.3 Data Reduction

The reference for the specified procedures needs to be added.

The subsection on data reporting is needed.

Section 4.0 Instructions, Procedures and Drawings

References to the site-wide QAPjP should include specific section numbers.

Table 3

The symbol Pg is not understood.

Section 12.0 Control of Measuring and Test Equipment

The specific model numbers of equipment need to be provided on the list of field water monitoring equipment. The list of equipment is not consistent with that listed in SOP 4.2. Consistency is necessary.

Appendix A

Please check units and chemical names, several of them are incorrect. For example, the units for the detection limit of percent solids in soil and sediment samples should be mg/kg not mg. The 16th compound on page 32 should be trans-1,3-dichloropropene and the second compound on page 33 should be n-nitroso-di-n-propylamine.

Environmental Evaluation (June, 1991) Comments

General Comments

The workplan states that the EE for OU5 will be integrated with EEs for OUs 1 and 2. However, there is not an explanation of the methods to be used in integrating the data resulting from the studies. The overlap between the operable units must be identified. Sampling of vegetative communities for vegetative analysis provides an example. The required sample numbers is determined by statistical evaluation of sample adequacy. Because the workplan does not specify a required sample number, the assumption must be made that the samples will be taken until adequacy is met. Difficulties may arise due to high variability in vegetative types. The workplan does not specify if adequacy will be based on only OU5 samples or all OU samples. The correlations between the studies and basis of adequacy must be addressed.

The workplan states that air monitoring will be conducted as part of OU 5 activities. However, as commented on above, the workplan is lacking inclusion of an air monitoring program specific to OU5. Air monitoring can be a necessary part of the EE and must be addressed.

Section 9.1.1 Approach, Task 8

Here and in other parts of the text, the Natural Resource Damage Assessment Rule is referenced as 40CFR Subtitle A Section 11.62. The correct reference is 43 CFR Subtitle A Section 11.62(f).

Table 9-2

Include an additional footnote to the table to indicate that the July 1, 1991 Federal Register contains a notice of the final rule establishing 2 mg/L as the MCL for barium. The effective date for this MCL is January 1, 1993. Also, the MCL for selenium of 50 ug/L is effective July 30, 1992. Add a footnote indicating this.

The workplan must identify state water quality standards (Executive Order 12088 requires compliance with state water quality standards). Standards set for the Rocky Flats stream reaches will become effective (1993) prior to remediation of OU5 and therefore must be evaluated.

Section 9.1.1 Metals

Please include the references for the toxicity values indicated for metals in this portion of the workplan (page 9-11).

Section 9.2.1.1 Selection Criteria for Contaminants of Concern

The text indicates in this section that the process for selecting contaminants of concern is being developed as a Standard Operation Procedure. EPA believes this is inappropriate. Section IV in the Statement of Work of the Interagency Agreement specifies that the Standard Operating Procedures shall detail field techniques to be used during investigation of the site. EPA does not consider the application of this criteria for the selection of contaminants of concern to be a field activity. Many of the factors which will be considered during the selection process are dependent on interpretation of available data and information in the scientific literature. EPA believes that selection criteria are appropriately developed in discussions and working sessions of the Risk Assessment Technical Working Group and appropriately documented in meeting minutes or summaries. The application of the criteria is an evaluation activity not a field activity and should be documented in the RFI/RI report.

Section 9.2.1.2 Identification of Key Receptors - Table 9-5

Selection criteria for key receptors is based on several criteria of which four are identified. Based on these criteria, it is not clear why cheatgrass and bindweed are included on the table. Only three grasses and two upland forbs are identified in the workplan. Additionally, the selection of only two species that are associated with damaged ecosystems appears to bias the study to a finding of no impact. Selection criteria must be evaluated against the preliminary list prior to identifying the key receptors for the study.

Section 9.2.1.3 Reference Areas

EPA agrees that reference areas should be selected based on measurement endpoints and that more than one reference area may be used depending on the effects to be studied. EPA suggests that the RFI/RI report contain a matrix of candidate reference areas and selection criteria to lend support to decisions on which areas are chosen for various comparisons.

Section 9.2.2 Task 2: Data Collection/Evaluation and Conceptual Model Development

Please elaborate on what other DOE facilities will be sued in the development of a preliminary list of contaminants of concern and how information from other facilities will be considered.

Section 9.2.5 Task 4: Toxicity Assessment

The last sentence in this section indicates that the adequacy of the existing toxicological database will be evaluated. EPA and CDH need to be closely involved in such an evaluation.

Figure 9-4, Decision Process on Use of Reference Areas for Contaminants in Tissues:

The footnote on this figure indicates that ARARs are not applicable if they are below background. This is incorrect. Background is a consideration in the development of remediation goals, as are ARARs. However, the consideration of background is irrelevant when determining whether or not criteria should be considered as an ARAR. Delete this portion of the footnote.

Table 9-6, Proposed EE Report Outline for Woman Creek Drainage

Include sections on sediment and air in section 6.2, Exposure Point Identification.

Section 9.2.11 Task 10: Environmental Evaluation Report

The text states that biomagnification of contaminant residues will be traced from organisms at the top of the food chain back through intermediate trophic levels to the abiotic environment. This implies that the model to determine no effects criteria will be validated using site-specific data. Clarification is necessary as to how biomagnification by organisms at the top of the food chain will be calibrated or validated without collection and chemical analysis of terrestrial animals.

Section 9.3.2 Sample Location and Frequency

It is not clear if a transect is considered a sample point or if each sample location along the transect will be a sample point. For a stratified random approach, the data from the entire transect must be considered as one data point because it is the location of the random transect.